

## OPPORTUNITIES IN FARM MANAGEMENT: DISCUSSION/ CHALLENGE

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The role of cognitive science as presented by Black offers an in-depth treatment of the current agricultural information processing and interpretation revolution and the contributions of other disciplines, ranging from engineering and psychology, finance and medicine, to the science of decisionmaking in agriculture. Certainly, many farm management economists will find the issues of information reception, styles of thinking, systems science approaches, biological pathways in modeling, psychological types, and other cognitive science issues raised in this session to be important and useful in the context of both basic and applied research. Agricultural economists are again reminded of the need to integrate approaches across models, the payoff to alternative degrees of approximating reality and the usefulness of a better balance in the portfolio of microcomputer activities.

At this point it is expedient to consider the many additional areas where farm management has made large contributions. The continuing durability and evolution of farm record keeping, enterprise budgeting, optimum application rates, and risk analysis in decisionmaking are outstanding achievements. Financial records analysis, capital rationing and debt management studies, tax accounting and analysis, and an area that may be called farm management/marketing are currently making remarkable advances that were much needed. The brightest area in farm management in the 1970's and 1980's has undoubtedly been the generation of microcomputer software. This development is now contributing significantly to every subfield from finance and taxes to marketing and whole-farm planning. Important contributions have been made in integrated pest management (IPM), bio-economic modeling, reduced and alternative tillage methods, the economics of irrigation scheduling, and many other applied production areas. Finally, there appears to be progress initiated by the Economics Research Service, USDA, in development and coordination of micro-mod-

eling (e.g., Baum and Schertz). These areas will continue to present opportunities for high quality professional contributions in the future.

### FARM MANAGEMENT AND ECONOMICS

This discussion will focus on what are perhaps more fundamental issues in farm management. The direction taken was stimulated by an opening citation in the session. That is, Glenn Johnson's well-travelled "resistance groups" argument that the incorporation of farm management into agricultural economics departments was a mistake because this resulted in a *de facto* distancing from the social and technical sciences.

The role of farm management has been actively debated since its beginnings. Few if any of the early issues—control of farm management by agricultural interest groups, importance vs. expense of farm cost accounts, relation to agricultural sciences, relation to economics—have been settled at this date. Most agricultural economics graduate students and perhaps most agricultural economists would be hard-pressed to decide which one (or two) of the following categories farm management best accommodates: (a) an applied subfield of production economics, (b) firm level resource allocation, (c) enterprise budgeting and financial record-keeping, (d) forms of business organization tax management, leasing arrangements and workshops on benefits and requirements of farm programs, and (e) microcomputer management techniques. Can farm management deliver the above without an in-depth research and data collection function? What is farm management's actual role in policymaking—is it after-the-fact? Without a well circumscribed self-concept, it is at best difficult to chart future directions and to provide a consistent quality product in a period of decreasing real budgets.

One way to focus the farm management economics identity issue more directly would be

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Developed from invited discussion presented at the annual meeting of the Southern Agricultural Economics Association, Nashville, Tennessee, February 5-8, 1984. Invited papers are routinely published in the July *SJAE* without editorial review but with review of the copy editor (as per Executive Committee action June 25, 1982).

The helpful comments of two reviewers and the editors are acknowledged and appreciated.

to consider the consequences of establishment of a multidisciplinary "Journal of Farm and Ranch Decision Sciences." For many farm management economists, there would be not only logic but broad appeal to this idea. If this was followed by organization of "Farm Decision Science Centers" in schools of agriculture, perhaps farm management could at last shrug-off the "onus" of production economics. This may be beneficial for especially some farm management specialists; however, I am persuaded the agricultural economics discipline, in general, and the farm management product, in particular, would suffer severely as a result. The fundamental reason for this reservation is that instead of less economics, farm management would benefit from an infusion of more economics, and in turn the agricultural economics discipline would benefit from more rigorous farm management analyses.

Here I would like to make a distinction between "basic economics" and highly elaborate econometric studies. Quantification of rather basic behavioral relationships, their attached probabilities and their economic ramifications, is essential to effectively respond to questions raised daily by farmers and ranchers. For example, "What is the probability that if I control my family living expenses at 'x' level and practice annual cost-cutting at 'y' level, that my operation can economically survive with 'z' level of net cash returns during the next 5 years?"

A greater infusion of economics and applied statistical analysis into farm management would not only permit better treatment of probabilities of negative cash flows and contribute to estimation of subproduction functions identifying efficient combinations of inputs (Eddleman and Purcell), but would also enhance the blending of marketing and finance with production analysis (Lacewell and McGrann). The important task of integrating farm management extension with farm management research would be facilitated as the extension staff is exposed to additional economics training (Lacewell and McGrann). A final dividend is that the chasm between those calling themselves production economists and those identified as farm management economists would be lessened as applied economics became more central in farm management.

### THE DATA PROBLEM

An intensive amount of empirical observation is required to effectively respond to many important farm management issues. However, agricultural economics (as well as economics) does not usually subject itself to the "harsh discipline of systematic fact-finding" (Leontief, p. 217). Increasingly, less resources are devoted to gathering micro-level data and when such

data are collected, they are not rigorously analyzed. Consequently, we, as agricultural economists, know surprisingly few precise facts about the management behavior of U.S. producers. For example, the farm economy has recently endured its greatest recession since the Great Depression of the 1930's. Has the field of farm management effectively responded to this crisis?

The profession has in the last 80 years constructed a durable edifice of record keeping and analysis. Literally thousands of farmers in several states have made the quantum leap to accurate cost accounting, many as cooperators in farm management record keeping associations. The farm management association data include enterprise production levels, asset inventories, cash receipts and expenses, financial information, and often taxes and off-farm income (and sometimes family consumption data). While a great deal of time is spent processing farm record data, the problem is that frequently very little time is allocated to rigorously discerning what the data can tell us. We may not have progressed much beyond Mosher's descriptive analyses of 40 years ago.

High quality, highly detailed farm level data are apparently not often utilized in agricultural economics. This point is, I believe, illustrated in Table 1. During the years 1976-82, the *Southern Journal of Agricultural Economics* published slightly more than 300 articles. Of this number, 142 were based on hypothetical, survey, census, estimated, "observation" or no referenced sources of data. While it is granted that aggregate or survey data are sometimes extremely useful in economic analysis, these data sources usually do not present a high degree of detail regarding farm firm behavior. On the other hand, apparently only 9 of the 308 articles were based on data from detailed farm records. Typically in the case of most survey or census data sources, important economic variables are not available (or are left out) or there is no time progression in the data (on the same observations) to analyze dynamic phenomena.

Given our predilection to not effectively use farm level data (after all, it is very difficult, costly, and time-consuming to collect), Eddleman has suggested such data collection efforts be given reduced priority. Economic conditions, however, change very rapidly and economists must know how decisionmakers perceive problems, how they react, and how perceptions change (Sutton). In-depth time series data are essential to communicate this information to researchers. An up-to-date data base to provide input/output data in a continuing period of rapid technological change is essential for farm management research (Ewing). The data must permit aggregative analysis (Eddleman and Purcell) and, in this regard, recent efforts to create

TABLE 1. RELATIONSHIP OF DATA SOURCES AND MODELS IN ARTICLES IN THE *SJAE*, 1976-1982<sup>a</sup>

Models <sup>b</sup>	Data sources											No data	Total
	Farm records	Hypothetical	Experiment station	Survey	USDA	Census	Model farm	Estimated data	Agricultural statistics	Observation	Interviews	Government agencies	
Case study	1	2	5	2	1	1			1	1			14
Linear programming	1	4	6	3	1		4	3	2				24
Simulation	2	7	3	2	3	1		1		1			20
Econometric		2	8	5	13	6	1	7	7	4	1	4	58
Production function	2	2	4	2	2	1		1	1			1	16
Quadratic programming			2	1			1	1					5
Theoretical		1	1	4	3	2		1		1	1		14
Empirical and statistical analysis	1	12	10	16	21	7	1	2	5	2	4	2	83
Other types of analysis <sup>c</sup>	2	4	7	4	5	3	1	4	2	3	2	2	40
Discussion		3	4	1	5				1				18
Total	9	37	50	33	54	21	8	20	19	12	8	11	308

<sup>a</sup> The assistance of Michael Hill (Graduate Research Assistant, Auburn University) in preparing this table is gratefully acknowledged.

<sup>b</sup> Includes invited and refereed articles. Does not include discussions of invited papers. Most invited articles were not categorized as "discussion", but contained data and/or models. For example, only 2 of 9 invited articles in the July 1982 issue were "discussions".

<sup>c</sup> Models Included: Growth, Input-Output, Recursive, Empirical Demand, Least Cost, Cost Functions, Gibbs Model, Evaluations, Markov Chain.

a large firm level data bank by the National Economics Division staff of the Economics Research Service of the USDA are very encouraging.

More studies with titles such as "Farm Cost Structure and Opportunities for Cost Reduction" are needed (Bachman and Barton). The need for detailed production data has also been emphasized in recent, very promising dynamic analyses consisting of more detailed (esp. biologically) production function models that appear to better reflect within period changes of the production process (Antle, Chavas and Kliebenstein). A final point is that creation of high quality data bases beginning at the farm-firm level will permit farm management economists to more effectively research the input/output, resource allocation, organization, cash flow, price, technological change, tax, and inflation/deflation issues.

### MODELS AND MODELING

No doubt agricultural economics models today are larger and more complete than in the past; however, too frequently the results of our models will not survive careful validation of the behavioral assumptions and output. As an example, a farm growth study was recently completed on a farm enterprise where net worth (from a level of several hundred thousand dollars) increases by a factor of 4.8 in 10 years. The credibility of this result is not very good (especially when model assumptions are examined), and there are many similar examples. We have become technique oriented, "eco-

nomic plumbers" (Cochrane) who too frequently lose track of our underlying research purposes in the modeling process.<sup>1</sup> In a powerful passage discussing the 'technician' problem in graduate education, Castle raises a 'warning flag' that applies with force to farm management/production research.

*(The first warning flag) is the failure to distinguish between quantitative techniques and an empirical orientation. The purpose of empirical work in science is to permit the researcher to better analyze reality, but many of our quantitative techniques have no relation to this role. ...Such results are often incapable of being tested against past or future experience. Even where some testing might be done, it often is not. Thus the technique, instead of being a more powerful tool for analyzing experience, in effect isolates the researcher from reality. (p.828)*

Rudd terms this issue the fascination of quantitative techniques versus a reality orientation. The model is often interesting and the numbers are "silly." Real world clutter of consumption, tax, capital structure, and costs not to mention alternative firm goals, are assumed away. Validation can become a passing or non-issue since the real world is inefficient anyway (Hanson and Eidman).

The above citation perhaps applies to risk-modeling, which has become de rigueur in production economics. The mathematical

<sup>1</sup> In fairness, the tradeoff must be recognized between publishing research as early as possible so that especially producers benefit before results are dated as opposed to waiting to publish a finished product with no major modeling shortcomings. Many of us (including myself) are still searching for the proper balance between these two important priorities.

methodology is indeed fascinating; however, the conceptual usefulness may be limited (Antle). In this area as in others, the "observed level of factor use" is critical (Moscardi and de Janvry). If, as many believe, farm management (and production economics) research has become enamored, perhaps mesmerized, with methodology and theoretical concepts, the resolution of important farm problems has likely been given a diminished priority (Ruttan, Johnson). This portentous problem needs to be developed in critical discussions of present opportunities in the field of farm management.

### PROBLEM SELECTION

A fourth general issue in farm management economics relates to problem selection. If farm management is the problem-solving subfield of production economics, it appears to lack imagination, for there are in economic terms "life and death" issues in agricultural management that clearly need economic analyses. Instead, a vast amount of farm management resources are expended in service research and/or analysis of short-run problems (Castle) that are frequently useful to a very limited subset of producers. While this research can be important:

*The very nature of such service work limits its usefulness considerably. Frequently, the time and effort devoted to such questions could be more profitably allocated to the determination of general principles basic to the problem of the particular group and applicable to other similar problems and to other groups (Plaxico and Wiegmann, p. 191).*

Ewing and others advocate establishment of clear priorities to address this problem.

In agriculture, the important economic issues almost invariably become policy issues. Perhaps because "heavy criticism" can be directed at economists for unfavorable findings (Lacewell and McGrann), farm management has displayed a revealing reluctance to tackle agricultural policy. Unfortunately in this instance, policy needs the farm management input to resolve urgent and costly problems. The farm management input is, in this respect, useful because of the broad training afforded in farm management (Ewing), the focus on firm behavior and the close farm management relationship with producers and knowledge of producer conditions. Notably missing in much farm management research is the idea of an "obligation to work on major national issues that private and public decisionmakers cannot avoid" (Schertz, p. 12; my emphasis). I have found no better exposition of this idea than the following statement made in 1957 when per capita disposable income of farmers was only 48.7% of non-farm disposable

income (Agricultural Statistics), PL480 exports were increasing dramatically and the Soil Bank Program idled over 21 million acres (Cochrane and Ryan).

*The reason for the significance of policy for farm management research is not far to seek. Today, policy influences not merely the functioning of the price system and the tenure institutions (including property, tenancy, taxation, and credit) in the framework of which farm management decisions are made, but increasingly seeks to influence also individual prices, outputs, scale of operations, and production practices...Nor is policy merely concerned with farm income as a whole. Welfare considerations, that is, the effects upon income distribution among groups of farmers, play an increasingly important role. The more detailed and changeable, in terms of objectives, timing, and variables affected, the interest of policy becomes, the greater is the need on the part of those who propose, make, and adopt policies for information on the probable response by farmers before policies are put into effect. Likewise, bringing about the desired response to a given policy after it has been put into effect becomes important for those who execute policies (Ciriacy-Wantrup, p. 1301).*

Perhaps the problem from the farm management perspective pertains to the pervasiveness of distributional issues in policy analysis. This becomes apparent in most listings of major issues confronting farmers (Tweeten, Eddleman, and Purcell). In this case, however, a policy vacuum abhors efficiency, as evidenced by last year's farm program costs in excess of \$20 billion (farm program accounting has become so complex that inclusion of non-cash PIK costs has obscured the total cost in the \$20-\$30 billion range).

The importance of policy analysis in farm management was recognized in the past and is recognized today (Cochrane, Ewing, Castle, Hildreth, and others). This is especially true in the South, with its recent rapid expansion in agriculture (Castle). If farm management economists were to focus more resources on key policy questions, another difficulty might also be addressed, a noticeable lack of interest in farm management by many of the most capable graduate students (this may be especially true in some of the more prestigious agricultural economics departments).

A final point on problem selection needs to be made. It is paradoxical that a subdiscipline of economics with primary emphasis on efficient

allocation of inputs and outputs may not be carefully weighing the benefits and costs of research and extension activities (Eddleman discusses this issue generally). If farm management as well as marketing, production, and resource economists comprehensively considered the probable payoff of research, I am convinced that both commercial and small producers would be better-served than currently.

### SUMMARY

To an important and unsettling degree, many economists (including farm management specialists) believe farm management economics today is not disciplined in systematic fact-finding, not fleshing economic models with behavioral assumptions that are carefully validated, not providing in-depth policy analysis of important farm issues and not adequately measuring benefits and costs of research. Instead of less cooperation, more integration of farm management and agricultural economics is necessary. Solid economics with quality data addressing important farm firm issues is essen-

tial for a high farm management payoff. Applied economics analysis needs to continue to provide a powerful incentive for farm management economists to "concentrate the mind" on key issues in production. This will be particularly important in the next 5-10 years in order to respond adequately to the critical management issues raised by the "biotech" revolution.

We as farm management economists need to be careful in our collection of data and construction of models, and then we must aim the focus of research at what T. W. Schultz long ago so effectively called problems of "divergence" between expectations and realizations "*the gap between them is a positive measure of what is probably the most important source of inefficiency and waste...*" (p. 586). Farm management contributions have been exceptional in the past, continue to be fundamental at present and have much to offer for the future. What continues to be needed is vision, scholarship, leadership and finally communication. This challenge comprises the largest and most significant "Opportunity in Farm Management" at this time.

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